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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOSEPHUS ARNOLDUS KAHLMAN,
MENNO WILLEM JOSE PRINS, and HENDRIK VAN HOUTEN

Appeal 2009-012188
Application 10/536,637
Technology Center 1600

Decided: March 15, 2010

Before TONI R. SCHEINER, LORA M. GREEN, and
RICHARD M. LEOVITZ, *Administrative Patent Judges*.

GREEN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1-8. We have jurisdiction under 35 U.S.C. § 6(b).

STATEMENT OF THE CASE

Claim 1 is representative of the claims on appeal, and reads as follows:

1. A device having biomolecular binding sites for a biomolecule, comprising:
a resonance circuit, said resonance circuit comprising a resonance frequency (f) determining sensor element or being electrically coupled to a resonance frequency determining sensor element, a remote power transmission element, which receives power and provides electrical power to the device, wherein binding at the biomolecular binding sites affects a physical property of the resonance frequency determining sensor element and thereby the resonance frequency, and a circuit, which is separate from the remote power transmission element, for RF communication of an RF signal in dependence of the resonance frequency of the resonance circuit.

The Examiner relies on the following evidence:

Oyama	US 5,552,274	Sep. 3, 1996
Hirt	US 5,926,301	Jul. 20, 1999
Ruile	US 6,084,503	Jul. 4, 2000
Hardman	US 6,592,820 B1	Jul. 15, 2003
Ishikawa	WO 00/66781	Nov. 9, 2000

We affirm.

ISSUES

- 1) Is Ruile non-analogous art?
- 2) Is extrinsic evidence required to support the combination of Oyama and Ruile?

FINDINGS OF FACT

FF1 The Examiner rejects claims 1, 3-5, and 8 under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Oyama, Ruile, and Ishikawa. (Ans. 5.) As Appellants do not argue the claims separately, we focus our analysis on claim 1, and claims 3-5 and 8 stand or fall with that claim. 37 C.F.R. § 41.37(c)(1)(vii).

FF2 The Examiner cites Oyama for teaching a device comprising a sensor element that has a biomolecular binding site, wherein the sensor is “connected to an external oscillating circuit adapted to resonate with the frequency inherent in the quartz plates.” (Ans. 5.)

FF3 The Examiner finds further that Oyama teaches that the device provides “for both DNA detection and quantitative measurement of test DNA in a sample on the basis of the variation in resonance frequency.” (*Id.*)

FF4 The Examiner notes that Oyama “fails to teach a device comprising a remote power transmission element for receiving a resonant frequency.” (*Id.* at 6.)

FF5 The Examiner further notes that Oyama “fails to teach a device, wherein a circuit for RF communication of an RF signal in dependence of the resonance frequency of the resonant circuit is separate from the remote power transmission element, which comprises a coil for receiving RF power whereby the remote power transmission element is arranged for receiving an RF frequency different from the resonant frequency.” (*Id.*)

FF6 The Examiner finds that Ruile teaches a radio-interrogated surface wave sensor that is “used for qualitative/quantitative evaluation of a change

in the response of the surface-wave sensor and for receiving power transmitted from a remote RF transmitter.” (*Id.* at 6-7.)

FF7 The Examiner notes that Ruile teaches that its radio- and remote-interrogated detection system “can be used in [a] variety of different sensor devices including toll systems, piezoelectric sensors, temperature sensors, and chemical sensors.” (*Id.* at 25.) The Examiner finds further that a “[b]iosensor is a specific type of chemical sensor[], whose chemical substance to be detected is a biological substance.” (*Id.*)

FF8 Ruile teaches “a new configuration for a radio-interrogated, remote-interrogated sensor device with surface waves.” (Ruile, col. 2, ll. 19-21.)

FF9 Specifically, Ruile teaches:

Radio-interrogated surface-wave arrangements are already used, for example, in toll systems on roads, in inroad tunnels or the like, but in this case the detection of preprogrammed individual encoding of the impulse-response signal for object identification is involved. Radio-interrogated surface-wave arrangements have also been used in metrology, these arrangements being as a rule constructed as delay lines, and measures being taken for the purpose of measurement such that the measured quantity to be determined in the surface-wave arrangement causes a change in the propagation time in the acoustic wave. This change in propagation time may be based on an electric field (oriented transversely to the propagation direction of the surface wave) in the substrate body, this field producing, for example by piezoelectric effect, a change in propagation time in the corresponding partial region of the substrate body (European Reference 0166065). By way of example, a temperature sensor using the change in the wave propagation time is known (European Reference 0465029). *An arrangement which exploits an impedance change of an organic layer applied to the surface of the substrate body of the surface-wave arrangement is suitable for measuring surface*

loading of this layer, for example with a chemical substance to be identified/quantitatively measured (Electronics Letters, Vol. 23 (1987) No. 9 pp. 446/447). A relevant pressure meter is also known, in which the mechanical property of the body, for example flexion, altered as a function of the pressure in the material of the substrate body of the surface-wave arrangement, causes a change in the propagation time of the acoustic wave and renders it usable for determining the measured value (Proceedings IEEE, Vol. 64, (1976) pp. 754-6). However, in the case of the arrangements last mentioned here, a remote interrogation by radio is not provided.

(*Id.* at col. 1, l. 51-col. 2, l. 16 (emphasis added).)

FF10 The Examiner cites Ishikawa for teaching “a wireless power transmitting element (external control station) for transmitting power to another wireless power transmitting element in a circuit provided in a biosensor device.” (Ans. 7.)

FF11 The Examiner concludes that it would have been obvious to one of ordinary skill at the time of invention to include a remote RF transmitter and receiver having transmission and reception antennas with a circuit for RF communication of an RF signal in dependence of the resonance frequency circuit as taught by Ruile in the biosensor of Oyama “in order to provide a remote power source and interrogation device for DNA detection and quantitative measurement of test DNA in a sample on the basis of the variation in resonance frequency.” (Ans. 7.)

FF12 The Examiner concludes further that it would have been obvious to include a remote power transmitting element that comprises a coil as taught by Ishikawa in the biosensor taught by the combination of Oyama and Ruile

“in order to wirelessly transmit power to a biosensor device to interrogate individual or groups of biosensors.” (*Id.* at 8.)

FF13 The Examiner rejects claim 2 under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Oyama, Ruile, and Ishikawa, as further combined with Hirt. (*Id.*)

FF14 The Examiner also rejects claims 6 and 7 under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Oyama, Ruile, and Ishikawa, as further combined with Hardman. (*Id.* at 9.)

PRINCIPLES OF LAW

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of nonobviousness, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

In *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007), the Supreme Court rejected a rigid application of a teaching-suggestion-motivation test in the obviousness determination. The Court emphasized that “the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 418; *see also id.* at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Thus, an “[e]xpress suggestion to substitute one equivalent for another need not be

present to render such substitution obvious.” *In re Fout*, 675 F.2d 297, 301 (CCPA 1982).

Further,

[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

KSR, 550 U.S. at 417.

For example, in *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374 (Fed. Cir. 2007), the court noted that an inventor considering a hinge and latch mechanism for portable computers would naturally look to references employing other ““ housings, hinges, latches, springs, etc.”” which in that case came from areas such as ““ a desktop telephone directory, a piano lid, a kitchen cabinet, a washing machine cabinet, a wooden furniture cabinet, or a two-part housing for storing audio cassettes.”” *Id.* at 1380 (citing *In re Paulsen*, 30 F.3d 1475, 1481-1482 (Fed. Cir. 1994)).

Arguments not made are waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

ANALYSIS

Appellants argue that Ruile is non-analogous art. Specifically, Appellants assert that Ruile “relates to a radio-interrogated SAW sensor,” wherein the “sensors of the reference are applied to toll systems on highways and in road tunnels to measure road loading.” (App. Br. 4.) In

contrast, Appellants assert, the present invention is drawn to a biosensor.
(*Id.* at 4-5.)

Appellants argue further that “while the Examiner has proffered reasons why the combination of *Ruile, et al.* would have been obvious and would provide advantages, there is no extrinsic evidence provided to support these assertions.” (*Id.* at 5.)

Appellants’ arguments are not convincing. As noted by the Examiner, and not disputed by Appellants, *Ruile* also teaches that radio-interrogated surface-wave arrangements are already used in technologies such as chemical sensors. As noted by the Examiner, a biosensor is a specific type of chemical sensor. *Oyama* teaches a biosensor wherein the sensor is connected to an external oscillating circuit adapted to resonate with the frequency inherent in the quartz plates. Thus, the ordinary artisan working in the biosensor field would have been aware of other technology dealing with sensors in general, such as that taught by *Ruile*. In addition, “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR*, 550 U.S. at 417. Appellants have provided no evidence that it would be beyond the level of skill of the ordinary artisan to use the remote RF transmitter and receiver having transmission and reception antennas with a circuit for RF communication of an RF signal in dependence of the resonance frequency circuit of *Ruile* in the biosensor *Oyama*.

We also do not agree that there is a need for extrinsic evidence supporting the rejection that the combination would have been obvious and would provide advantages. As discussed above, Ruile specifically teaches the use of such systems in a chemical sensor providing evidence that persons of skill in the art would have found reason to have used Ruile's teachings in combination with Oyama. Moreover, the Supreme Court in *KSR* has rejected the need for providing "precise teachings directed to the specific subject matter of the challenged claim," as the analysis "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* at 418. The Examiner has provided a reason as to why the ordinary artisan would combine Ruile and Oyama, and Appellants have not pointed to any flaws in that reason.

As to the rejections of claims 2, 6, and 7, Appellants reiterate the arguments made with respect to claim 1. (App. Br. 6.) Those arguments are not found to be convincing for the reasons set forth above.

CONCLUSIONS OF LAW

We conclude:

- 1) Ruile is not non-analogous art.
- 2) Extrinsic evidence is not required to support the combination of Oyama and Ruile

We thus affirm the rejection of claim 1 under 35 U.S.C. § 103(a) over the combination of Oyama, Ruile, and Ishikawa. As claims 3-5 and 8 stand or fall with claim 1, we affirm the rejection as to those claims as well.

As Appellants have not presented separate arguments as to the remaining rejections, we also affirm the rejection of claim 2 under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Oyama, Ruile, and Ishikawa, as further combined with Hirt, as well as the rejection of claims 6 and 7 under 35 U.S.C. § 103(a) as being rendered obvious by the combination of Oyama, Ruile, and Ishikawa, as further combined with Hardman.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

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